 acid polymer dopant in a second organic solvent, said Lewis acid electrically conductive polymer selected from the group consisting of substituted and unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes, polypyrroles, polyselenophenes, polyacetylenes, formed from soluble precursors and combinations and blends thereof, and said Lewis acid polymer dopant being a polydopant selected from the group consisting of polyacrylic acids, polysulfonic acid, cellulose sulfonic acid, polyamic acid, polyphosphoric acid, polymers containing acid chloride (-CO-Cl) and polymers containing sulfonyl chloride groups, wherein said Lewis acid polymer dopant dopes said Lewis base electrically conductive polymer in undoped form to obtain said electrically conductive polymer blend, the resulting doped conductive product being soluble in the combination of said first and said second organic solvents and miscible at the molecular level, said first and said second organic solvents being the same or different.--

REMARKS

The courtesies extended by the Examiner to Applicants' attorney during the telephone conference held with the Examiner in the latter part of April 1997 is gratefully acknowledged.

Certain claims have been amended to conform with the Examiner's statements concerning allowable claims 60, 61, 71, 87 and 88.

Claim 89 has been added to the case which embodies all of the components of the composition in Markush form. Although Claim 89 is dependent upon Claim 53, the claim defines the metes and bounds of the invention and can stand on its own if the dependent language (i.e., "defined in Claim 53") were to be deleted. Claim 89 contains the Markush groups defining the Lewis acids and the Lewis bases embodied in the invention.

The balance of the claims have been amended to correct their dependencies on the appropriate independent claims.

Applicants' invention is a liquid compatible blend comprising a doped product which is formed from blending a Lewis acid electrically conductive polymer in undoped form contained in a first solution with a Lewis acid polymer dopant contained in a second solution. As a result of the blending, the Lewis acid polymer dopant dopes the Lewis base electrically conductive polymer in undoped form to obtain the electrically conductive polymer blend. Unlike the prior art references cited by the Examiner the resulting doped conductive product is soluble in the blend of first and second solvents and is miscible at the molecular level. Further, the solvents noted can be the same or different. None of the prior art teaches this product or method of making same.

Applicants have submitted a declaration which meets the burden of all applicants in a cases such as this: i.e., to demonstrate patentably significant differences in the product of their invention compared with the prior art products. This showing was demonstrated in the declaration and the video tape, both submitted earlier. The difference is solubility.

The prior art references cited by the Examiner to Sakai et al., Wei et al. and Tieke et al. all teach the *in-situ* polymerization of monomers such as aniline, pyrrole, etc. in the presence of an electrolyte such as a polyacid.

Using the Wei et al. reference as representative of the teachings of the three prior art references noted above, Applicants duplicated the process described in Example 1 of the Wei et al. reference using an addition polymerization process by polymerizing aniline monomer with ammonium peroxydisulfate in the presence of polystyrenesulfonic acid in aqueous solution. To demonstrate the difference in final product, Applicants added a stoichiometric amount of aniline to a 15% aqueous solution of polystyrenesulfonic acid to obtain a molar ratio of aniline to polystyrenesulfonic acid of 1:1. Upon the addition of the oxidant, ammonium peroxydisulfate, a precipitate formed immediately. Attempts to dissolve the precipitate were unsuccessful. Thus the resulting product was insoluble. Contrast this with Applicants' soluble product.

Applicants performed additional experiments using the procedure of Wei et al. In each case, they determined experimentally that once the polymer precipitated out of solution, it did not subsequently dissolve to any appreciable extent in an organic solvent.

To demonstrate the unexpected results obtained using the present invention teaching compared with prior art, a solution of polyamic acid, as representative of the other operative Lewis acid embodiments, was prepared. A solution of the conducting polymer precursor (i.e. the polyaniline) was prepared in NMP. The dopant solution of the polyamic acid


was added to the polyaniline solution with vigorous stirring. The polyamic acid doped the polyaniline to the doped form resulting in a conducting polyamic-polyaniline blend in which the constituents remain in solution and do not precipitate out of solution. At no time did the conducting polymer blend precipitate from solution. That is, the precursor polymer (the conducting polymer in undoped form) and the polyacid are both soluble in a given solvent. The reaction of the two is carried out in solution, and the product, which is the conducting polymer remains soluble in the given solvent. This result is clearly different from and unobvious in view of the prior art.

Unlike the results of the present invention, in each instance where the method of Wei et al. was followed, polyaniline/polyacid precipitated out of solution. This result is significant and demonstrates a difference in kind since one of applicants' preferred embodiments uses polyamic acid. (See specification, page 23, Example 1.)

The polymer resulting from the Wei et al. method cannot be dissolved because the Wei et al. polymer blend systems forms an interpenetrating system in which significant interchain interaction exists between polymer chains. By way of contrast, Applicants have eliminated the insolubility problem inherent in the prior art. Applicants attain a different conducting polymer structure using the same components but a different molecular structure. This is accomplished using a process different from the processes disclosed in the prior art references. The structure of Applicants' blend is different from that of the *in-situ* polymerized blends described above. Applicants' product possess different properties. The prior art blends are insoluble, whereas Applicants' product is soluble.

In view of the modifications to the claims and based upon the arguments submitted during the various interviews, allowance of the claims is respectfully requested.

Respectfully Submitted,



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MAILING CERTIFICATE

Date of Deposit: July 29, 1997

I hereby certify that this amendment

of six pages relating to

Patent Application Serial No. 08/118,475

is being deposited with the United States

Postal Service under 37 CFR §1.10 on the date

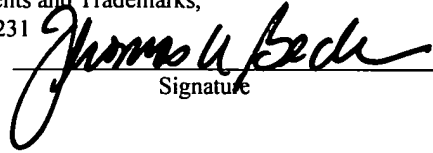
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